

MATH 2050A Tutorial 2

1. Find the limit of the following sequences by definition

(a) $\lim \frac{n}{n^2+1}$

(b) $\lim \frac{2n}{n+2}$

2. Show that $\lim(\sqrt{n^2+1} - n) = 0$.

3. Show that if $x_n \geq 0$ for all $n \in \mathbb{N}$ and $\lim(x_n) = 0$, then $\lim(\sqrt{x_n}) = 0$.

4. **Theorem 2.5.5** The unit interval $[0, 1] := \{x \in \mathbb{R} : 0 \leq x \leq 1\}$ is not countable.